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to appear. The fore and hind limbs suffer rotation, so that the resultant upper surface of either is homologous with the lower surface of the other, as in Ceratodus. Pulmonary breathing begins before the external gills show signs of degeneration. About six weeks after hatching, the external gills are lost. The young Lepidosiren is remarkably newt-like in its general appearance and uses its hind limbs in clambering about the vegetation. It also has some powers of change of color by the action of its chromatophores. P.

Multiplication of Nuclei in Transversely Striped Muscle Fibres of Vertebrates.[1] — Godelewski's work, of which he gives a preliminary account, was carried on at the Anatomical Institute of the Jagellonian University at Krakow. The material was from late embryos and recently born young of the guinea pig and mouse, and from larvæ of Salamandra. To avoid undue contraction of the muscles the whole extremity was employed; it was fixed in Perenyi's fluid or in concentrated sublimate solution plus 2 per cent acetic acid. The sections, 5 μ thick, were stained either in thionin or in Heidenhain's iron-hæmatoxylin, followed by Bordeaux R or eosin.

In the quiescent nuclei of embryonic or larval muscle cells the chromatin constitutes a thin layer at the periphery of the nucleus, which contrasts sharply by its blue color with the single brilliant red nucleolus. That the nuclei are highly elastic is shown by the flattened forms they assume in muscles that have strongly contracted owing to their being cut away from their attachments to bone before fixing.

Nuclear reproduction takes place both by the mitotic and by the amitotic process. The author has observed all stages of mitosis in muscle fibres that were already distinctly striped, not only in the deep nuclei, but also in those that had already attained a peripheral position. The approaching division is indicated by an increase both in the size of the nucleus and in the distinctness of the chromatic network. The nucleolus disappears. The fibrillæ next the nucleus separate a little from each other, and a clear fluid plasma accumulates around the nucleus. If this is a marginal nucleus, it protrudes with its enveloping plasma beyond the surface of the fibre.

Special attention was directed to the question of the presence of centrosomes. Though previous observers have never announced the existence of centrosomes in differentiated transversely striped muscle tissue, the author found them in typical form, not only in the monaster stage, but even as early as the spireme stage. In the former the central corpuscle, stained black in iron-hæmatoxylin, was surrounded by a typical polar star. Also in the diaster stage the centrosomes continue to be evident; the axis of the central spindle is at first straight, but later may become bent; the interzonal filaments, with their equatorial thickenings, become pressed together to form the deeply staining "Zwischenkörper," which here, as in other cases, is not dependent on the formation of a cell wall. In the [cup-shaped] depression of the nuclei of the diaster stage a remnant of the centrosome and the achromatic cone fibres is still visible, and after the formation of a nuclear membrane around the two masses of chromatin, establishing the two daughter-nuclei, traces of the "Zwischenkörper" and central spindle are still to be seen.

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[1] Godelewski, E., Jr. Ueber die Vermehrung in den quergestreiften Muskelfasern der Wirbelthiere, *Bull. de l'Acad. des Sciences de Cracovie.* Avril, 1900.

During karyokinesis the surrounding protoplasm acquires a granular appearance. The granules, which are deeply stained in iron-hæmatoxylin, appear in the monaster stage; in the diaster stage and the following anaphase these increase in number, so that the mitotic figure is surrounded by coarsely granular protoplasm.

In addition to the karyokinetic, there is also an amitotic nuclear division, and while in general it may be said that the latter method replaces the former, the author is unable to say just when the one ceases or the other begins. Both processes are, indeed, to be seen in older embryos at the same time and in the same muscle. The first indication of the non-mitotic division is to be seen in the nucleoli, of which there are at first one or two to each nucleus. The nucleolus elongates, becomes narrower in the middle, at length dumb-bell-shaped, and finally divided; the two nucleoli then move apart. This process may be repeated. The chromatic substance meanwhile becomes collected into lumps of irregular form, which are, however, uniformly distributed through the nucleus.

The actual division of the nucleus may take place in one or the other of two ways: First, by the formation of a thin, flat partition, which is perpendicular to the axis of the elongated nucleus or, often, oblique to it. Sometimes only a single partition is formed, but often the nucleus is divided by such partitions into as many as six, or even more, portions — the new or daughter nuclei; secondly, by the formation of invaginations from [*i.e.*, constrictions of] the periphery of the nucleus this very much elongated body is finally divided into two, or sometimes several, not always equal, parts, each of which contains a single nucleolus or, less often, two. The daughter-nuclei separate from each other, but occasionally they remain connected by a bridge of substance, and in some cases this is elongated, so that when several daughter-nuclei in succession are thus joined they resemble a rosary.

Both forms of fragmentation may occur side by side in the same muscle, and even in the same nucleus. Besides these nearly transverse divisions, a longitudinal splitting of the nucleus is sometimes met with.

H.

Are the Solpugids Poisonous? — It has long been a disputed question as to whether the arachnids known as Solpugids are poisonous or not. In the regions where they occur they have a very bad reputation; but naturalists who have studied their structure have never found poison glands or ducts. Recently Lönnberg[1] has described his observations on *Galeodes araneoides* in the neighborhood of Baku, on the Caspian. He found that the "falanger," as the Russians call it, did not poison insects and other animals upon which it preyed. In attacking a small scorpion it crushed one of the slender joints of the abdomen and then the segment containing the poison sac. It next attacked the larger abdominal segments, working its jaws into the interior and devouring the flesh. During this whole time the scorpion struggled and fought, moving freely and showing no sign of being poisoned. It could not penetrate the skin of a frog, although it attempted to bite it several times. Finally Lönnberg and a friend both allowed the Galeodes to attempt to bite them; but its jaws were not strong enough to penetrate the thickened skin of the finger tips, while flies which were bitten, but which did not have the nervous system injured, were able to crawl around a long time after being bitten. These facts, together with the absence of openings in the chelæ through which poison could escape, led Lönnberg to the conclusion that Galeodes at least is not venomous. At the time for hibernation it dug into the ground, using the two anterior pairs of legs, but where the earth was harder it used the chelæ to remove small stones and bits of clay.

New Jersey Insects. — Professor J. B. Smith's list of the insects occurring in New Jersey is issued as a Supplement to the *27th Annual Report of the State Board of Agriculture* and may be considered a revised and enlarged edition of the one published in 1890 by the Geological Survey of New Jersey. It makes a volume of more than

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[1] *Ofversigt k. Vet. Akad. Forhandl. Stockholm*, Bd. lvi (1900), p. 977.